

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	2	("4816339").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/03/18 08:16
L2	2	("4983182").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/03/18 11:16
L3	100	bone near3 pieces! with pin	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/03/18 13:12
L4	11	("4858603" "4877020" "4932973" "5112354" "5405391" "5439684" "5571190" "5798096" "5865848" "5888222" "5899939").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2005/03/18 11:35
L5	16	3 and (graft\$3 or transplant\$5)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/03/18 13:45
L6	1548	(623/17.11,17.16,23.51,23.56,23.63).CCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/03/18 13:59
L7	248	6 and @pd>"20040722"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/03/18 14:00

	Document ID	Kind Code	Source	Issue Date	Pages	Image D
1	US 6767369 B2		USPAT	20040727	36	US 6767
2	US 6767367 B1		USPAT	20040727	21	US 6767
3	US 6767366 B2		USPAT	20040727	13	US 6767
4	US 20040148029 A1		US-PGP	20040729	36	US 2004
5	US 20040148028 A1		US-PGP	20040729	13	US 2004
6	US 20040148027 A1		US-PGP	20040729	55	US 2004
7	US 20040147929 A1		US-PGP	20040729	12	US 2004
8	US 20040147928 A1		US-PGP	20040729	32	US 2004
9	US 6770096 B2		USPAT	20040803	12	US 6770
10	US 6770074 B2		USPAT	20040803	70	US 6770
11	US 20040153155 A1		US-PGP	20040805	15	US 2004
12	US 6773460 B2		USPAT	20040810	12	US 6773
13	US 20040158330 A1		US-PGP	20040812	6	US 2004
14	US 20040158328 A1		US-PGP	20040812	35	US 2004
15	US 20040158327 A1		US-PGP	20040812	30	US 2004
16	US 20040158326 A1		US-PGP	20040812	26	US 2004
17	US 20040158325 A1		US-PGP	20040812	55	US 2004
18	US 20040158324 A1		US-PGP	20040812	6	US 2004
19	US 6776938 B2		USPAT	20040817	17	US 6776
20	US 6776860 B2		USPAT	20040817	13	US 6776
21	US 6776800 B2		USPAT	20040817	24	US 6776
22	US 6776798 B2		USPAT	20040817	18	US 6776
23	US 20040162622 A1		US-PGP	20040819	23	US 2004
24	US 20040162618 A1		US-PGP	20040819	17	US 2004
25	US 20040162617 A1		US-PGP	20040819	27	US 2004
26	US 20040162616 A1		US-PGP	20040819	36	US 2004
27	US 20040167628 A1		US-PGP	20040826	30	US 2004
28	US 20040167627 A1		US-PGP	20040826	11	US 2004
29	US 20040167625 A1		US-PGP	20040826	75	US 2004
30	US 20040167538 A1		US-PGP	20040826	21	US 2004
31	US 20040167537 A1		US-PGP	20040826	39	US 2004
32	US 20040167534 A1		US-PGP	20040826	39	US 2004
33	US 20040167372 A1		US-PGP	20040826	10	US 2004
34	US 6783547 B2		USPAT	20040831	13	US 6783
35	US 6783546 B2		USPAT	20040831	25	US 6783
36	US 6783545 B2		USPAT	20040831	8	US 6783
37	US 20040172140 A1		US-PGP	20040902	16	US 2004
38	US 20040172134 A1		US-PGP	20040902	12	US 2004
39	US 20040172133 A1		US-PGP	20040902	21	US 2004
40	US 20040172132 A1		US-PGP	20040902	13	US 2004
41	US 20040172131 A1		US-PGP	20040902	14	US 2004
42	US 20040172130 A1		US-PGP	20040902	9	US 2004
43	US 20040172129 A1		US-PGP	20040902	15	US 2004



US 20040172133A1

(17) United States

(12) Patent Application Publication
Gerber et al.

(37) Pub. No.: US 2004/0172133 A1

(43) Pub. Date: Sep. 2, 2004

(54) INTERVERTEBRAL IMPLANT FOR
TRANSFORAMINAL POSTERIOR LUMBAR
INTERBODY FUSION PROCEDURE

Publication Classification

(75) Inventors: David Gerber, CH-Arborn (CH);
Dominique Messerli, West Chester, PA
(US); David Paul, Ploersville, PA
(US)(51) Int. Cl.⁷ A61F 2/44; A61F 2/46
(52) U.S. Cl. 622/17.11

(57) ABSTRACT

Correspondence Address:
JONES DAY
122 EAST 41ST ST
NEW YORK, NY 10017 (US)

(73) Assignee: Synthes(U.S.A.)

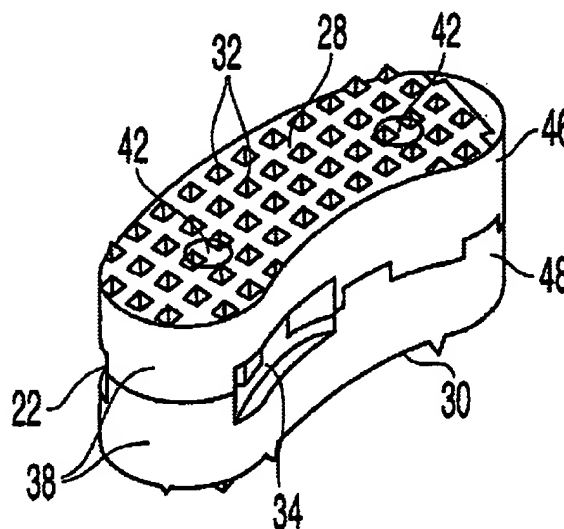
(21) Appl. No.: 10/797,984

(22) Filed: Feb. 26, 2004

Related U.S. Application Data

(63) Continuation of application No. 09/548,178, filed on
May 3, 2001, now Pat. No. 6,719,794.

An intervertebral implant for fusing vertebrae is disclosed. The implant has a body with curved, substantially parallel posterior and anterior faces separated by two narrow implant ends, superior and inferior faces having a plurality of undulating surfaces for contacting upper and lower vertebral endplates, and at least one depression at a first end for engagement by an insertion tool. The implant includes configuration features for insertion of the implant from a transforaminal approach into a symmetric position about the midline of the spine so that a single implant provides balanced support to the spinal column. The implant may be formed of a plurality of interconnecting bodies assembled to form a single unit. An implantation kit and method are also disclosed.



Document ID	Kind Code	Source	Issue Date	Pages	Image D-
170	US 6843805 B2	USPAT	20050118	4	US 6843
171	US 6843804 B2	USPAT	20050118	23	US 6843
172	US 20050015155 A1	US-PGP	20050120	22	US 2005
173	US 20050015154 A1	US-PGP	20050120	19	US 2005
174	US 20050015151 A1	US-PGP	20050120	13	US 2005
175	US 20050015150 A1	US-PGP	20050120	30	US 2005
176	US 20050015149 A1	US-PGP	20050120	51	US 2005
177	US 20050015148 A1	US-PGP	20050120	12	US 2005
178	US 20050015147 A1	US-PGP	20050120	12	US 2005
179	US 20050015146 A1	US-PGP	20050120	8	US 2005
180	US 6846328 B2	USPAT	20050125	22	US 6846
181	US 20050021151 A1	US-PGP	20050127	8	US 2005
182	US 20050021150 A1	US-PGP	20050127	20	US 2005
183	US 20050021144 A1	US-PGP	20050127	13	US 2005
184	US 20050021143 A1	US-PGP	20050127	4	US 2005
185	US 20050021041 A1	US-PGP	20050127	38	US 2005
186	US 6849093 B2	USPAT	20050201	17	US 6849
187	US 6849092 B2	USPAT	20050201	13	US 6849
188	US 20050027367 A1	US-PGP	20050203	15	US 2005
189	US 20050027362 A1	US-PGP	20050203	27	US 2005
190	US 20050027361 A1	US-PGP	20050203	30	US 2005
191	US 20050027360 A1	US-PGP	20050203	18	US 2005
192	US 20050027359 A1	US-PGP	20050203	9	US 2005
193	US 20050027358 A1	US-PGP	20050203	8	US 2005
194	US 20050027033 A1	US-PGP	20050203	15	US 2005
195	US 6852128 B2	USPAT	20050208	12	US 6852
196	US 6852127 B2	USPAT	20050208	12	US 6852
197	US 6852126 B2	USPAT	20050208	20	US 6852
198	US 20050033441 A1	US-PGP	20050210	95	US 2005
199	US 20050033440 A1	US-PGP	20050210	95	US 2005
200	US 20050033439 A1	US-PGP	20050210	29	US 2005
201	US 20050033438 A1	US-PGP	20050210	7	US 2005
202	US 20050033437 A1	US-PGP	20050210	27	US 2005
203	US 20050033433 A1	US-PGP	20050210	19	US 2005
204	US 20050033432 A1	US-PGP	20050210	35	US 2005
205	US 20050033431 A1	US-PGP	20050210	28	US 2005
206	US 20050033430 A1	US-PGP	20050210	14	US 2005
207	US 20050033429 A1	US-PGP	20050210	10	US 2005
208	US 20050033428 A1	US-PGP	20050210	4	US 2005
209	US 6855169 B2	USPAT	20050215	24	US 6855
210	US 6855168 B2	USPAT	20050215	38	US 6855
211	US 6855167 B2	USPAT	20050215	42	US 6855
212	US 6855166 B2	USPAT	20050215	17	US 6855



US06855167B2

(12) **United States Patent**
Shimp et al.

(10) Patent No.: **US 6,855,167 B2**
(45) Date of Patent: **Feb. 15, 2005**

(54) **SPINAL INTERVERTEBRAL IMPLANT, INTERCONNECTIONS FOR SUCH IMPLANT AND PROCESSES FOR MAKING**

FOREIGN PATENT DOCUMENTS

DE 198 15 407 10/1999 F16B1/004
EP 1 084 860 1/2001 A61F2/40
SU 590572 A 1/1985 E23-POB 16
WO 93/05914 3/1993
WO 93/34327 3/2000
WO 93/49226 7/2001 A61F2/44
WO 93/70136 9/2001 A61F2/28
WO 93/70137 9/2001
WO 93/70139 9/2001 A61F2/33
WO 93/78798 10/2001 A61L27/36

(73) Inventors: Lawrence A. Shimp, Morganville, NJ (US); John M. Winterbottom, Jackson, NJ (US); David R. Kase, Toms River, NJ (US); Todd M. Boyce, Aberdeen, NJ (US); Erik O. Martin, Howell, NJ (US)

(73) Assignee: Osteotech, Inc., Easton, NJ (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 36 days.

(21) Appl. No.: 10-005,338

(22) Filed: Dec. 5, 2001

(45) Prior Publication Data

US 2003/0025428 A1 Jan. 5, 2003

(31) Int. Cl.⁷ A61F 2/44; A61F 2/28

(52) U.S. Cl. 623/17.11; 623/23.63; 623/91.9; 403/408.1

(58) Field of Search 403/408.1, 13, 403/14; 623/17.11, 17.16, 16.11, 13.17, 18.11, 27.51, 23.61, 23.63, 919, FOR 16, FOR 17: 605/76

References Cited

U.S. PATENT DOCUMENTS

2,375,116 A 5/1945 Lachis 182/36
3,058,910 A 12/1962 Richardson 144/12
3,604,298 A 9/1971 Deibel 83/624
4,876,915 A 11/1989 Brannigan
4,904,281 A 2/1990 Dowe et al.
4,936,768 A 7/1990 Wu 623/76
5,192,327 A 3/1993 Bourgeois
5,296,254 A 3/1994 Prewett et al.
5,314,476 A 5/1994 Prewett et al.

(List continued on next page.)

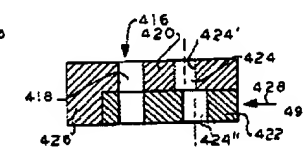
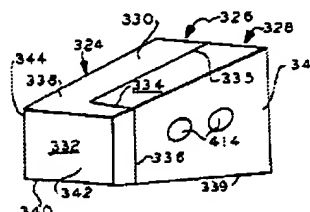
OTHER PUBLICATIONS

Allograft Freeze-Dried Release Specifications, Osteotech, Inc., Sep. 30, 1992, 3 pages.
VQ2™ Interbody Bone Grafts, DuPuy Acromed, 2000, 6 pages.
Albre, Fred H., Bone Surgery with Machine Tools, Scientific American, Apr. 1936, pp. 178-181.
MTF Bone Catalog, Femoral Wedges, Femoral Struts, Tibial Struts, published prior to 2000, 1 page.
International Search Report, Nov. 11, 2003.

Primary Examiner—David H. Wilke
(73) Attorney, Agent, or Firm—Carroll Byrne Bain
Giffman Stewart et al; Elliot M. Olszewski; William Squire

(57) **ABSTRACT**
A cortical bone implant is formed of two or more planks of bone which are connected with one or more offset pins. The pins may be right circular cylinders inserted into a corresponding offset bore which offset bends the inserted pin. The bending creates compression and tensile loads in the pin which loads create friction compression forces on the planks connecting them to the pins by friction. The pins may have different shapes to form the offsets and different configurations for friction attachment to the planks. The implants may be formed of E or L-shaped planks or bones formed into other shapes, including interlocking arrangements. Processes and firmures are disclosed for forming the pins, planks and implants. Various embodiments of the pins, planks, implants and processes are disclosed.

28 Claims, 21 Drawing Sheets



Document ID	Kind Code	Source	Issue Date	Pages	Image No.
34 US 5242447 A		USPAT	19930907	5	US 5242
35 RU 2000749 C		DERWEN	19931015	1	1994-05
36 DE 4223794 A	A1, C2	DERWEN	19940127	6	DE 4223
37 US 5338197 A		USPAT	19940816	10	US 5338
38 US 5372538 A		USPAT	19941213	6	US 5372
39 US 5417692 A		USPAT	19950523	13	US 5417
40 DE 29615148 U		DERWEN	19961024	30	DE 2961
41 US 5611801 A		USPAT	19970318	5	US 5611
42 WO 9714367 A1		EPO	19970424	50	WO 9714
43 US 5662648 A		USPAT	19970902	10	US 5662
44 US 5665086 A		USPAT	19970909	13	US 5665
45 US 5713787 A		USPAT	19980203	6	US 5713
46 US 5716358 A		USPAT	19980210	11	US 5716
47 US 5728099 A		USPAT	19980317	13	US 5728
48 US 5741251 A		USPAT	19980421	8	US 5741
49 US 5776194 A		USPAT	19980707	26	US 5776
50 US 5776133 A		USPAT	19980707	9	US 5776
51 US 5827283 A		USPAT	19981027	9	US 5827
52 US 5827283 A		DERWEN	19981027	9	US 5827
53 US 5846245 A		USPAT	19981208	22	US 5846
54 US 5868747 A		USPAT	19990209	12	US 5868
55 US 5921985 A		USPAT	19990713	10	US 5921
56 DE 19811354 A		DERWEN	19990923	16	DE 1981
57 WO 9951160 A		DERWEN	19991014	15	WO 9951
58 US 5973223 A		USPAT	19991026	13	US 5973
59 US 5976134 A		DERWEN	19991102	17	US 5976
60 DE 19832514 A1		EPO	20000127	10	DE 1983
61 DE 19832514 A		DERWEN	20000127	10	DE 1983
62 US 6019769 A		USPAT	20000201	21	US 6019
63 US 6025538 A		USPAT	20000215	16	US 6025
64 US 6027504 A		USPAT	20000222	41	US 6027
65 US 6093190 A		USPAT	20000725	7	US 6093
66 WO 200047245 A		DERWEN	20000817	27	WO 2000
67 EP 1088532 A	A2, A3	DERWEN	20010404	4	EP 1088
68 US 6241773 B1		USPAT	20010605	8	US 6241
69 US 6261292 B1		USPAT	20010717	6	US 6261
70 US 6280446 B1		USPAT	20010828	8	US 6280
71 US 20010031254 A1		US-PGP	20011018	24	US 2001
72 US 20010039458 A1		US-PGP	20011108	31	US 2001
73 US 20010039456 A1		US-PGP	20011108	32	US 2001
74 US 20010041941 A1		US-PGP	20011115	31	US 2001
75 US 20020029084 A1		US-PGP	20020307	42	US 2002
76 US 6371959 B1		USPAT	20020416	12	US 6371



US 20020029084A1

(17) United States

(12) Patent Application Publication

Paul et al.

(10) Pub. No.: US 2002/0029084 A1

(45) Pub. Date: Mar. 7, 2002

(54) BONE IMPLANTS WITH CENTRAL CHAMBERS

Related U.S. Application Data

(75) Inventors: David C. Paul, Phoenixville, PA (US);
Hansjörg W. Knoch, Philadelphia, PA (US);
Bert Schenk, Regier, PA (US);
Michael L. Boyer II, Pott, PA (US);
Thomas B. Higgins, Berwyn, PA (US)

(53) Continuation-in-part of application No. 09/561,844,
filed on Jul. 30, 1999.

Publication Classification

(51) Int. Cl.⁷ A61F 2/28
(52) U.S. Cl. 62/23.61, 606.72

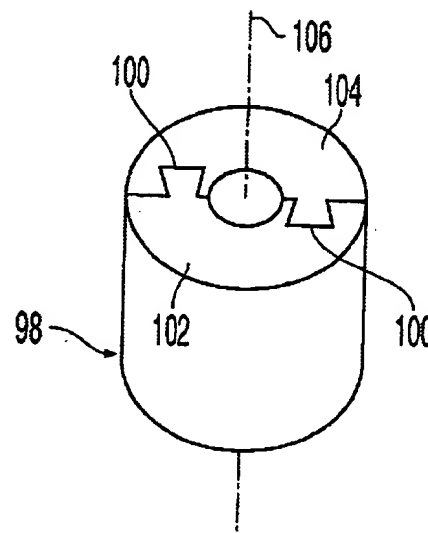
Correspondence Address:
PENNIE & EDMONDS LLP
1647 K STREET NW
SUITE 1000
WASHINGTON, DC 20006

(57) ABSTRACT

The present invention relates to an implant comprising two or more bone fragments that are combined to form a single unit. Cancellous bone or cortical bone is removed from a source and fashioned into bone components with desirable shapes and sizes. The bone components may be integrated to form implants for implantation in the body. Bone stock may be formed by combining sections of various bones of the body, and the bone stock may be further fashioned for use as implants with particular geometries.

(21) Appl. No.: 09/814,214

(22) Filed: Mar. 23, 2001



	Document ID	Kind Code	Source	Issue Date	Pages	Image Doc
1	US 4858603 A		USPAT	19890822	4	US 4858603
2	US 4877020 A		USPAT	19891031	6	US 4877020
3	US 4932973 A		USPAT	19900612	5	US 4932973
4	US 5112354 A		USPAT	19920512	7	US 5112354
5	US 5405391 A		USPAT	19950411	11	US 5405391
6	US 5439684 A		USPAT	19950808	9	US 5439684
7	US 5571190 A		USPAT	19961105	7	US 5571190
8	US 5798096 A		USPAT	19980825	12	US 5798096
9	US 5865848 A		USPAT	19990202	14	US 5865848
10	US 5886222 A		USPAT	19990330	10	US 5886222
11	US 5899939 A		USPAT	19990504	8	US 5899939



US005899939A

United States Patent [19]

Boyce et al.

[11] Patent Number: 5,899,939
[45] Date of Patent: May 4, 1999

[54] BONE-DERIVED IMPLANT FOR LOAD-SUPPORTING APPLICATIONS

[75] Inventors: Todd M. Boyce, Aberdeen; Albert Maurique, Manalapan; Nelson L. Scarborough, Ocean; James L. Russell, Little Silver, all of N.J.

[73] Assignee: Osteotech, Inc., Easton, N.J.

[21] Appl. No.: 08/005,997

[22] Filed: Jan. 21, 1998

[51] Int. Cl. A61F 2/28

[52] U.S. Cl. 623/16; 623/11; 523/113; 523/115

[58] Field of Search 623/11, 16; 523/113; 523/115

[55] References Cited

U.S. PATENT DOCUMENTS

3,609,867 10/971 Rodash.
3,791,527 2/974 Rodash.
4,394,370 7/983 Ardenas.
4,530,700 7/984 Simstad.
4,603,750 4/994 Olsvick et al.
4,672,840 9/984 Jeffries.
4,685,087 11/984 Bell.
4,712,058 4/985 Alexander et al.
4,816,576 5/985 Menendez et al.
4,823,553 11/985 Rice et al.
4,827,853 12/986 Campbell et al.
4,834,536 1/987 Dorman et al.
4,837,951 1/988 Schmitt.
4,878,420 7/987 Nash et al.

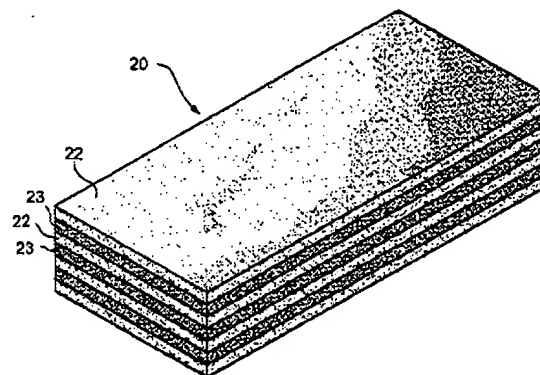
4,698,375 10/987 Dorman et al.
4,795,467 1/989 Pitt et al.
4,842,654 6/989 Dorman et al.
4,972,573 6/990 Oleson.
5,007,530 4/991 Dorman et al.
5,053,049 10/991 Campbell.
5,071,436 12/991 Hae et al.
5,238,456 3/993 O'Leary et al.
5,268,254 3/994 Parvett et al.
5,306,302 4/994 Bous et al.
5,305,304 4/994 Oleson.
5,314,476 5/994 Parvett et al.
5,356,629 10/994 Sanders et al.
5,425,763 6/995 Boyden, Jr.
5,425,770 6/995 Pitt et al.
5,464,496 11/996 Oleson.
5,507,813 4/996 Dorn et al.
5,522,695 6/996 Mbow.
5,722,004 6/998 Morris et al.
5,531,791 7/998 Walchberger, Jr.
5,556,436 9/998 Oleson.
5,573,771 11/998 Oleson et al.
5,583,110 12/998 Brulman et al.
5,645,591 7/999 Robinson et al.
5,683,459 11/999 Brulman.

Primary Examiner—Paul B. Prebble
Attorney, Agent, or Firm—Dwight & Burnes

[57] ABSTRACT

A bone-derived implant is provided which is made up of one or more layers of fully mineralized or partially demineralized cortical bone and, optionally, one or more layers of some other material. The layers constituting the implant are assembled into a unitary structure to provide an implant exhibiting good overall load-supporting properties.

13 Claims, 3 Drawing Sheets



	Document ID	Kind Code	Source	Issuance Date	Pages	Image Doc
1	US 4858603 A		USPAT	19890822	4	US 4858603
2	US 4877020 A		USPAT	19891031	6	US 4877020
3	US 4932973 A		USPAT	19900612	5	US 4932973
4	US 5112354 A		USPAT	19920512	7	US 5112354
5	US 5405391 A		USPAT	19950411	11	US 5405391
6	US 5439684 A		USPAT	19950808	9	US 5439684
7	US 5571190 A		USPAT	19961105	7	US 5571190
8	US 5798096 A		USPAT	19980825	12	US 5798096
9	US 5865848 A		USPAT	19990202	14	US 5865848
10	US 5888222 A		USPAT	19990330	18	US 5888222
11	US 5899939 A		USPAT	19990504	8	US 5899939

than any optional layer(s) that may be present. Thicknesses ranging from about 0.5 to about 20, and preferably from about 1.5 to about 15 mm can advantageously be used. In general, the number and thickness of the compression-strength imparting layers in a given bone-derived implant will be such as to provide an overall compression strength for the implant of from about 25 to about 250, and preferably from about 100 to about 200 MPa.

(3) The sources of cortical bone for the bone-derived implant of this invention are preferably allogenic but also include xenogenic sources such as bovine and porcine bone. Where partially or fully demineralized cortical bone is utilized, such bone can be obtained employing known demineralization techniques, e.g., those employing strong acids such as hydrochloric acid as described in Reddi et al., Proc. Nat. Acad. Sci. 69, pp. 1601-5 (1972), herein incorporated by reference. The extent of demineralization is a function of the strength of the acid solution, the shape of the bone and the duration of the demineralization treatment. Reference in this regard may be made to Lewandowski et al., J. Biomed Materials Res, 31, pp365-372 (1996), also incorporated herein by reference. The use of partially or fully demineralized bone can be beneficial herein since such substances exhibit greater initial osteogenic and/or osteoinductive activity than fully mineralized bone.

(4) The compression strength-imparting layer(s) of the bone-derived implant can be provided as monolithic sections of bone or as multi-sectional layers built up from two or more subsections, e.g., joined to each other in edge-to-edge fashion in a manner which is analogous to planking. In this way, relatively large compression strength-imparting layers can be constructed from smaller bone sections to provide an implant whose overall size is not limited by the size and/or shape of the cortical bone which is available for its construction.

(5) Assembling the superimposed layers into a strong unitary structure can be accomplished by a variety of means/procedures, e.g., application of known and conventional biologically compatible adhesives such as the cyanoacrylates; epoxy-based compounds, dental resin sealants, dental resin cements, glass ionomer cements, polymethyl methacrylate, gelatin-resorcinol-formaldehyde glues, collagen-based glues, inorganic bonding agents such as zinc phosphate, magnesium phosphate or other phosphate-based cements, zinc carboxylate, etc., and protein-based binders such as fibrin glues and mussel-derived adhesive proteins; the use of mechanical fasteners such as nails, screws, dowels, etc., which can be fabricated from natural or synthetic materials and bioabsorbable as well as nonbioabsorbable materials; laser tissue welding; and, ultrasonic bonding. If desired, the layers of the bone-derived implant can be provided with mechanically interengaging features, e.g., tongue-and-groove or mortise-and-tenon elements, to facilitate their assembly into the final product and/or to fix the layers to each other in a more secured fashion. In addition to its compression strength-imparting fully mineralized or partially mineralized cortical bone layers, the bone-derived implant of this invention can optionally possess one or more layers formed from one or more other materials. For example, these optional layers can be based on or include highly or fully demineralized bone, graphite or pyrolytic carbon, a mineral material such as hydroxyapatite, tricalcium phosphate, bioglass or other bioceramic or natural or synthetic polymers, e.g., bioabsorbable materials such as starches, polyglycolide, polylactide, glycolide-lactide copolymer, and the like, and nonbioabsorbable polymers such as polymethyl methacrylate, polytetrafluoroethylene, polyurethane, polyethylene and nylon.

(6) If desired, the compression strength axis of one or more compression strength-imparting layers can be offset relative to the compression strength axis of one or more of the other compression strength-imparting layers in an arrangement much like that of plywood. For example, compression strength axes of alternating compression strength-imparting layers can be offset by up to 90 degrees from the compression strength axes of the other compression strength-imparting layers in the implant in order to distribute the overall load-supporting capacity of the implant in mutually transverse directions.

	Document ID	Kind Code	Source	Issue Date	Pages	Image D-
5	US 3862631 A		USPAT	19750128	4	US 3862
6	US 4098269 A		USPAT	19780704	4	US 4098
7	US 4187841 A		USPAT	19800212	8	US 4187
8	SU 825044 B		DERWEN	19810505	NA	
9	US 4365624 A		USPAT	19821228	20	US 4365
10	BE 895728 A	A1, B1	DERWEN	19830516	12	EP 1178
11	US 4503847 A		USPAT	19850312	30	US 4503
12	US 4535763 A		USPAT	19850820	21	US 4535
13	EP 153546 A	A1, B1	DERWEN	19850904	34	EP 1535
14	EP 194187 A	A1, B1	DERWEN	19860910	19	EP 1941
15	SU 1342513 A		DERWEN	19871007	NA	
16	US 4714076 A		USPAT	19871222	14	US 4714
17	US 4730608 A		USPAT	19880315	8	US 4730
18	CH 665766 A5		EPO	19880615	4	CH 6657
19	CH 665766 A		EPO	19880615	4	CH 6657
20	CH 665766 A		DERWEN	19880615	4	CH 6657
21	EP 314593 A	A1, B1	DERWEN	19890503	5	EP 3145
22	US 4828495 A		USPAT	19890509	14	US 4828
23	JP 01265953 A		JPO	19891024	5	JP 0126
24	US 4890631 A		USPAT	19900102	9	US 4890
25	US 4969909 A		USPAT	19901113	4	US 4969
26	US 5013318 A		USPAT	19910507	7	US 5013
27	US 5067962 A		USPAT	19911126	5	US 5067
28	EP 463551 A1	A1, B1	EPO	19920102	8	EP 4635
29	EP 463551 A	A1, B1	DERWEN	19920102	8	EP 4635
30	US 5147367 A		USPAT	19920915	9	US 5147
31	JP 04300533 A		JPO	19921023	8	JP 0430
32	US 5180388 A		USPAT	19930119	6	US 5180
33	JP 05007604 A	A, U	JPO	19930119	5	JP 0500
34	US 5242447 A		USPAT	19930907	5	US 5242
35	RU 2000749 C		DERWEN	19931015	1	1994-05
36	DE 4223794 A	A1, C2	DERWEN	19940127	6	DE 4223
37	US 5338197 A		USPAT	19940816	10	US 5338
38	US 5372538 A		USPAT	19941213	6	US 5372
39	US 5417692 A		USPAT	19950523	13	US 5417
40	DE 29615148 U		DERWEN	19961024	30	DE 2961
41	US 5611801 A		USPAT	19970318	5	US 5611
42	WO 9714367 A1		EPO	19970424	50	WO 9714
43	US 5662648 A		USPAT	19970902	10	US 5662
44	US 5665086 A		USPAT	19970909	13	US 5665
45	US 5713787 A		USPAT	19980203	6	US 5713
46	US 5716358 A		USPAT	19980210	11	US 5716
47	US 5728099 A		USPAT	19980317	13	US 5728

U.S. Patent

Feb. 10, 1998

Sheet 3 of 5

5,716,358

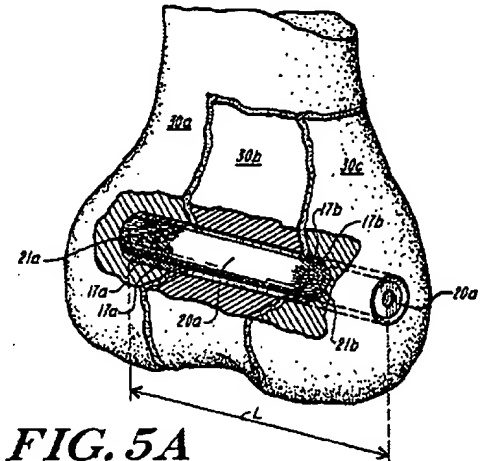


FIG. 5A

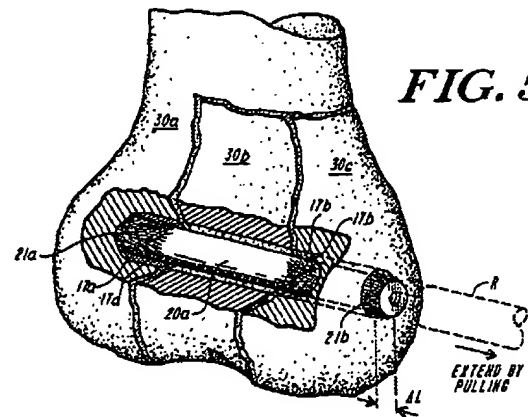


FIG. 5B

File Edit View Tools Window Help

	Document ID	Kind Code	Source	Issue Date	Pages	Image D+
1	US 1550400 A		USOCR	19250818	5	US 1550
2	US 2443106 A		USOCR	19480608	9	US 2443
3	US 2690198 A		USOCR	19540928	8	US 2690
4	US 2857621 A		USOCR	19581028	2	US 2857
5	US 3862631 A		USPAT	19750128	4	US 3862
6	US 4098269 A		USPAT	19780704	4	US 4098
7	US 4187841 A		USPAT	19800212	8	US 4187
8	SU 825044 B		DERWEN	19810505	NA	
9	US 4365624 A		USPAT	19821228	20	US 4365
10	BE 895728 A	A1, B1	DERWEN	19830516	12	BP 1178
11	US 4503847 A		USPAT	19850312	30	US 4503
12	US 4535763 A		USPAT	19850820	21	US 4535
13	EP 153546 A	A1, B1	DERWEN	19850904	34	EP 1535
14	BP 194187 A	A1, B1	DERWEN	19860910	19	BP 1941
15	SU 1342513 A		DERWEN	19871007	NA	
16	US 4714076 A		USPAT	19871222	14	US 4714
17	US 4730608 A		USPAT	19880315	8	US 4730
18	CH 665766 A5		EPO	19880615	4	CH 6657
19	CH 665766 A		EPO	19880615	4	CH 6657
20	CH 665766 A		DERWEN	19880615	4	CH 6657
21	EP 314593 A	A1, B1	DERWEN	19880503	5	EP 3145
22	US 4828495 A		USPAT	19890509	14	US 4828
23	JP 01265953 A		JPO	19891024	5	JP 0126
24	US 4890631 A		USPAT	19900102	9	US 4890
25	US 4969909 A		USPAT	19901113	4	US 4969
26	US 5013318 A		USPAT	19910507	7	US 5013
27	US 5067962 A		USPAT	19911126	5	US 5067
28	EP 463551 A1		EPO	19920102		
29	EP 463551 A		DERWEN	19920102		
30	US 5147367 A		USPAT	19920915		
31	JP 04300533 A		JPO	19921023		
32	US 5180388 A		USPAT	19930119		
33	JP 05007604 A		JPO	19930119		
34	US 5242447 A		USPAT	19930907		
35	RU 2000749 C		DERWEN	19931015		
36	DE 4223794 A		DERWEN	19940127		
37	US 5338197 A		USPAT	19940816		
38	US 5372538 A		USPAT	19941213		
39	US 5417692 A		USPAT	19950523		
40	DE 29615148 U		DERWEN	19961024		
41	US 5611801 A		USPAT	19970318		
42	WO 9714367 A1		EPO	19970424		
43	US 5662648 A		USPAT	19970902		



Numéro de publication: **0 314 593 A1**

DEMANDE DE BREVET EUROPEEN

Numéro de dépôt: 8840007.3

Int. Cl. A 61 F 2/42
A 61 B 17/56

Date de dépôt: 20.10.88

Priorité: 87.10.87 FR 8713084

Date de publication de la demande: 03.08.89 Bulletin 89/18

Etat contractants désignés: AT BE CH DE ES GB GR IT U LU NL SE

Demandeur: Barock, Louis Samuel
La Manchette - Yveron
F-33870 Tremasse (FR)

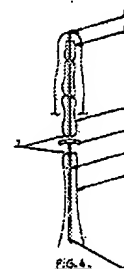
Inventeur: Barock, Louis Samuel
La Manchette - Yveron
F-33870 Tremasse (FR)

Mandataire: Thibault, Jean-Louis
Cabinet Thibault S.A. 60 Cours de Verdun
F-33000 Bordeaux (FR)

Implant prothétique articulaire à fixation temporaire.

- L'objet de l'invention est un implant prothétique articulaire à fixation temporaire, plus particulièrement destiné aux pieds et aux mains, caractérisé en ce qu'il est constitué, d'une part, d'une cupule (1) percée en son centre d'un trou (2) et destinée à être mise en place entre deux plaques osseuses (4,5) au droit de leur articulation et, d'autre part, d'une broche (3) de fixation, amovible, susceptible de coulisser librement dans le trou (2) de ladite cupule (1) et destinée à immobiliser provisoirement la cupule (1) et les plaques osseuses adjacentes (4,5) en étant enfilée au travers des trous réduits des plaques osseuses préétablies (4,5) et du trou (2) de la cupule (1) préalablement mises en place.

- Application à la chirurgie orthopédique en particulier des pieds et des mains.



EP 0 314 593 A1

	Document ID	Kind Code	Source	Issue Date	Pages	Image D+
1	US 1550400 A		USOCR	19250818	5	US 1550
2	US 2443106 A		USOCR	19480608	9	US 2443
3	US 2690198 A		USOCR	19540928	8	US 2690
4	US 2857621 A		USOCR	19581028	2	US 2857
5	US 3862631 A		USPAT	19750128	4	US 3862
6	US 4098269 A		USPAT	19780704	4	US 4098
7	US 4187841 A		USPAT	19800212	8	US 4187
8	BU 825044 B		DERWEN	19810505	NA	
9	US 4365624 A		USPAT	19821228	20	US 4365
10	BE 895728 A	A1, B1	DERWEN	19830516	12	BP 1178
11	US 4503847 A		USPAT	19850312	30	US 4503
12	US 4535763 A		USPAT	19850820	21	US 4535
13	BP 153546 A		DERWEN	19850904		
14	BP 194187 A		DERWEN	19860910		
15	BU 1342513 A		DERWEN	19871007		
16	US 4714076 A		USPAT	19871222		
17	US 4730608 A		USPAT	19880315		
18	CH 665766 A5		EPO	19880615		
19	CH 665766 A		EPO	19880615		
20	CH 665766 A		DERWEN	19880615		
21	BP 314593 A		DERWEN	19890503		
22	US 4828495 A		USPAT	19890509		
23	JP 01265953 A		JPO	19891024		
24	US 4890631 A		USPAT	19900102		
25	US 4969909 A		USPAT	19901113		
26	US 5013318 A		USPAT	19910507		
27	US 5067962 A		USPAT	19911126		
28	BP 463551 A1		EPO	19920102		
29	BP 463551 A		DERWEN	19920102		
30	US 5147367 A		USPAT	19920915		
31	JP 04300533 A		JPO	19921023		
32	US 5180388 A		USPAT	19930119		
33	JP 05007604 A		JPO	19930119		
34	US 5242447 A		USPAT	19930907		
35	RU 2000749 C		DERWEN	19931015		
36	DE 4223794 A		DERWEN	19940127		
37	US 5338197 A		USPAT	19940816		
38	US 5372538 A		USPAT	19941213		
39	US 5417692 A		USPAT	19950523		
40	DE 29615148 U		DERWEN	19961024		
41	US 5611801 A		USPAT	19970318		
42	WO 9714567 A1		EPO	19970424		
43	US 5662648 A		USPAT	19970902		

US-PAT-NO: 4503847

DOCUMENT-IDENTIFIER: US 4503847 A
See image for Certificate of Correction

TITLE: Prosthetic nail

----- KWIC -----

Brief Summary Text - BSTX (4):

It is well known to employ pins or nails for the purpose of attempting to stabilize certain types of fractures, for example, comminuted or complex fractures which are best treated by stabilization or internal fixation of the bone. Such pins or nails are described and illustrated in U.S. Pat. Nos. 2,579,968; 2,998,007; 3,433,220 and 3,439,671. However, the pins which are illustrated for example in the aforementioned '968 patent, although providing for connection of the broken ~~pieces of bone~~ do not provide for rotational stability because of their rod-like construction. In addition, most of these known nails or pins do not provide for any securement of the same to a portion of the bone.